

Listing of claims:

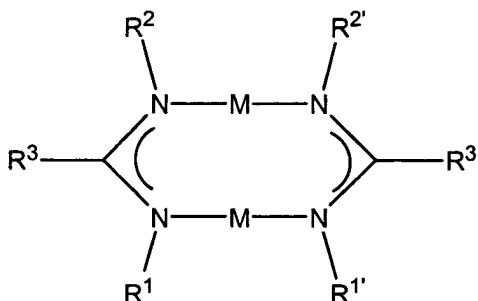
1. (Original) A process for forming a thin film comprising a metal, comprising:

exposing a heated substrate alternately to the vapor of one or more volatile metal amidinate compounds, and then to a reducing gas or vapor, to form a metal coating on the surface of the substrate.
2. (Original) The process of claim 1, wherein said reducing gas is hydrogen.
3. (Original) A process for forming a thin film comprising a metal nitride, comprising:

exposing a heated substrate alternately to the vapor of one or more volatile metal amidinate compounds, and then to a nitrogen-containing gas or vapor, to form a metal nitride coating on the surface of the substrate.
4. (Original) The process of claim 3, wherein the nitrogen-containing gas is ammonia.
5. (Original) A process for forming a thin film comprising a metal oxide, comprising:

exposing a heated substrate alternately to the vapor of one or more volatile metal amidinate compounds, and then to an oxygen-containing gas or vapor, to form a metal oxide coating on the surface of the substrate.
6. (Original) The process of claim 5, wherein the oxygen-containing vapor is water vapor.
7. (Previously Presented) The process of claim 1, 3 or 5, in which the volatile metal amidinate compound has a formula selected from the group consisting of $M(I)AMD$, $M(II)AMD_2$ and $M(III)AMD_3$ and oligomers thereof, where M is a metal and AMD is an amidinate moiety.

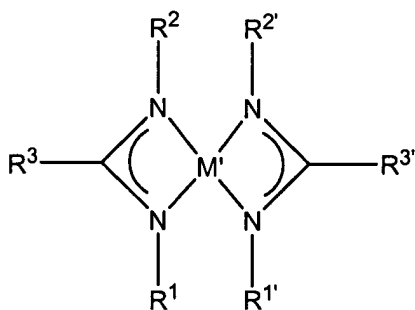
8. (Currently Amended) The process of claim 7, in which a volatile metal(I) amidinate compound is represented by the general formula for a dimer



or oligomers thereof, wherein the Rⁿ R¹, R^{1'}, R², and R^{2'} independently represent alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, or other non-metal atoms or groups that are not aryl, and R³ and R^{3'} independently represent hydrogen, alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, fluoroalkyl groups or other non-metal atoms or groups that are not aryl, Rⁿ being any one of the groups R¹ through R³, and wherein Rⁿ are the same or different.

9. (Currently Amended) The process of claim 7, where ~~M~~ M(I) is selected from the group consisting of ~~copper(I), silver(I), gold(I), and iridium(I),~~ copper, silver, gold, iridium, lithium, and sodium.

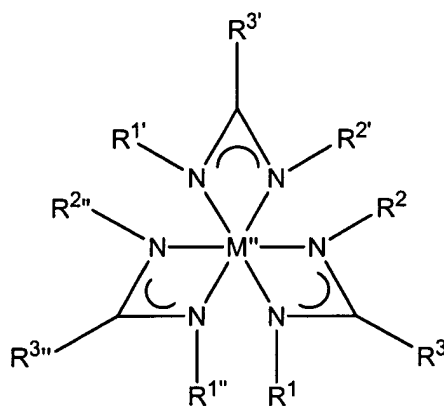
10. (Currently Amended) A process according to claim 1, 3, or 5, in which a volatile metal(II) amidinate compound is represented by the general formula



or oligomers thereof, wherein the R^n , R^1 , R^1 , R^2 , and $R^{2'}$ independently represent alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, or other non-metal atoms or groups that are not aryl, and R^3 and $R^{3'}$ independently represent hydrogen, alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, fluoroalkyl groups or other non-metal atoms or groups that are not aryl, R^n being any one of the groups R^1 through $R^{3'}$, and wherein R^n are the same or different.

11. (Currently Amended) The process of claim 10, where M' is selected from the group consisting of cobalt, iron, nickel, manganese, ruthenium, zinc, titanium, vanadium, chromium, strontium, europium, magnesium and calcium.

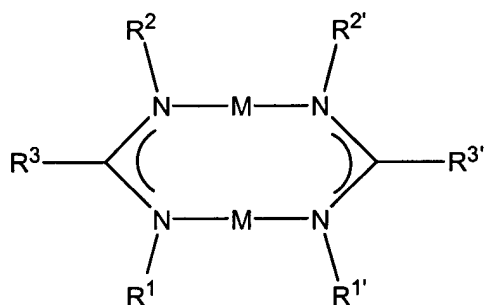
12. (Currently Amended) A process according to claim 1, 3 or 5, in which a volatile metal(III) amidinate compound is represented by the general formula



or oligomers thereof, wherein the R^n , R^1 , R^1 , R^2 , and $R^{2'}$ independently represent alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, or other non-metal atoms or groups that are not aryl, and R^3 and $R^{3'}$ independently represent hydrogen, alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, fluoroalkyl groups or other non-metal atoms or groups that are not aryl, R^n being any one of the groups R^1 through $R^{3'}$, and wherein R^n are the same or different.

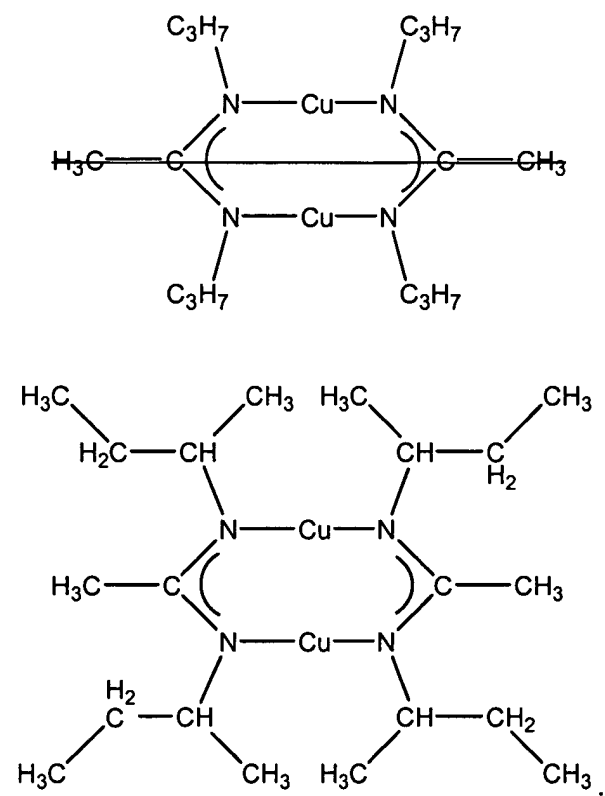
13. (Original) The process of claim 12, where M" is selected from the group consisting of lanthanum, praseodymium and the other lanthanide metals, yttrium, scandium, titanium, vanadium, niobium, tantalum, chromium, iron, ruthenium, cobalt, rhodium, iridium, aluminum, gallium, indium, and bismuth.

14. (Currently Amended) A composition of matter that is a volatile metal(I) amidinate represented by the general formula for a dimer,

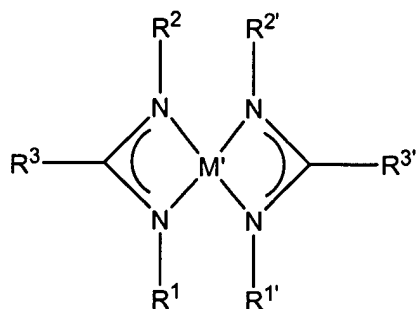


or ~~other oligomers of the same monomeric unit thereof~~, wherein M is selected from the metals copper, silver, gold, iridium, ~~lithium~~ and sodium, and wherein ~~the Rⁿ~~ R¹, R^{1'}, R², and R^{2'} independently represent alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, or other non-metal atoms or groups that are not aryl, and R³ and R^{3'} independently represent hydrogen, alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, fluoroalkyl groups or other non-metal atoms or groups that are not aryl, Rⁿ being any one of the groups R¹ through R^{3'}, and wherein Rⁿ are the same or different.

15. (Currently Amended) A composition of matter as in claim 14 ~~claim 13~~ having the chemical name copper(I) ~~*N,N'*-diisopropylacetamidinate~~ *N,N'*-di-*sec*-butylacetamidinate dimer and represented by the structural formula

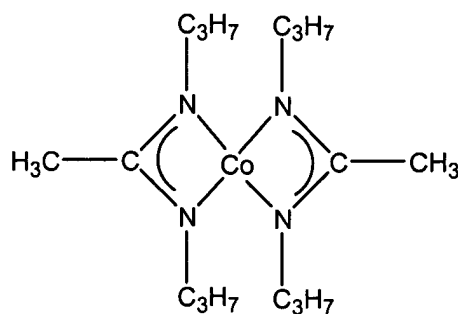


16. (Currently Amended) A composition of matter that is a volatile metal(II) bis(amidinate) represented by the general formula

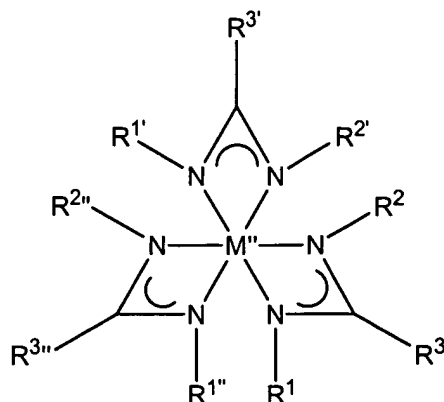


or ~~its oligomer~~ oligomers thereof, wherein the metal M is selected from cobalt, ~~iron~~, nickel, manganese, ruthenium, zinc, titanium, vanadium, ~~chromium~~, europium, strontium, and calcium, and wherein ~~the~~ R^n , $R^{1'}$, R^2 , and $R^{2'}$ independently represent alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, or other non-metal atoms or groups that are not aryl, and R^3 and $R^{3'}$ independently represent hydrogen, alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, fluoroalkyl groups or other non-metal atoms or groups that are not aryl, R^n being any one of the groups R^1 through R^3 , and wherein R^n are the same or different.

17. (Currently Amended) A composition of matter as in claim 16 ~~claim 15~~ having the chemical name cobalt(II) bis(*N,N'*-diisopropylacetamidinate) and structural formula

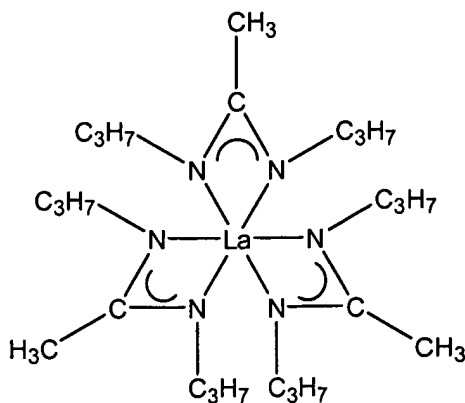


18. (Currently Amended) A composition of matter that is a volatile metal(III) tris(amidinate) represented by the general formula



or oligomers thereof, wherein the metal M is selected from lanthanum, praseodymium and the other lanthanide metals, yttrium, scandium, titanium, vanadium, chromium, iron, ruthenium, cobalt, rhodium, iridium, and bismuth, and wherein ~~the Rⁿ~~ R¹, R^{1'}, R², and R^{2'} independently represent alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, or other non-metal atoms or groups that are not aryl, and R³ and R^{3'} independently represent hydrogen, alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, ~~fluoroalkyl groups~~ or other non-metal atoms or groups that are not aryl, ~~Rⁿ being any one of the groups R¹ through R^{3'}, and wherein Rⁿ are the same or different.~~

19. (Original) A composition of matter as in claim 18 having the chemical name lanthanum(III) tris(*N,N'*-diisopropylacetamidinate) and structural formula



20. (New) A process for forming a thin film comprising a transition metal or a lanthanide metal, the process comprising:

exposing one or more volatile metal amidinate compounds, wherein the metal comprises a transition metal or a lanthanide metal, to a substrate to form the thin film comprising a transition metal or a lanthanide metal.

21. (New) The process of claim 20, further comprising:

exposing a reducing gas to the substrate.

22. (New) The process of claim 21, wherein the reducing gas or vapor is hydrogen.

23. (New) The process of claim 20, wherein the thin film comprises a metal nitride.

24. (New) The process of claim 23, further comprising:

exposing a gas comprising nitrogen to the substrate.

25. (New) The process of claim 24, wherein the gas comprising nitrogen is ammonia.

26. (New) The process of claim 20, wherein the thin film comprises a metal oxide.

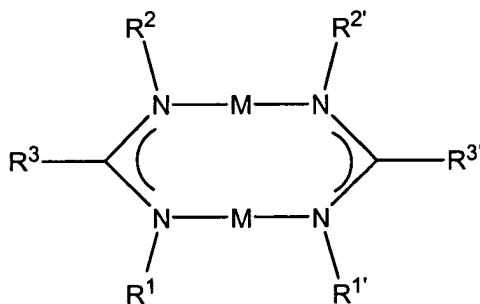
27. (New) The process of claim 26, further comprising:

exposing a gas comprising oxygen to the substrate.

28. (New) The process of claim 27, wherein the gas comprising oxygen is water vapor.

29. (New) The process of claim 20, wherein the one or more volatile metal amidinate compounds is selected from the group consisting of M(I)AMD, M(II)AMD₂ and M(III)AMD₃ and oligomers thereof, where M is a metal and AMD is an amidinate moiety.

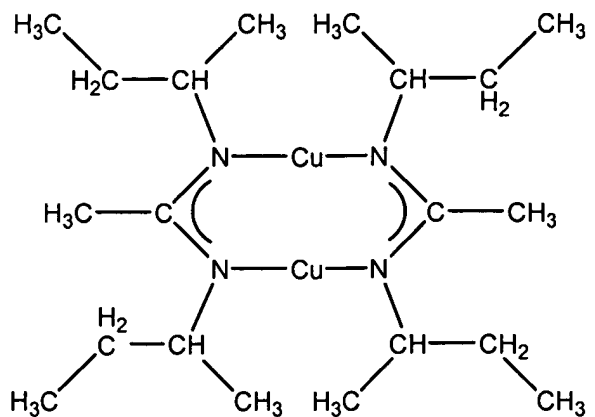
30. (New) The process of claim 20, wherein the one or more volatile metal amidinate compounds is represented by the general formula for a dimer



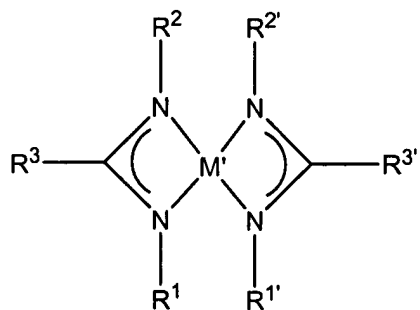
or oligomers thereof, wherein R¹, R^{1'}, R², and R^{2'} independently represent alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, or other non-metal atoms or groups that are not aryl, and R³ and R^{3'} independently represent hydrogen, alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, or other non-metal atoms or groups that are not aryl.

31. (New) The process of claim 30, wherein M is selected from the group consisting of copper, silver, gold, and iridium.

32. (New) The process of claim 31, wherein the one or more volatile amidinate compounds is copper(I) *N,N'*-di-*sec*-butylacetamidinate dimer represented by the structural formula



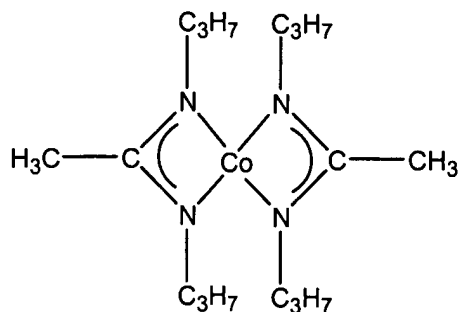
33. (New) The process of claim 20, wherein the one or more volatile metal amidinate compounds is represented by the general formula



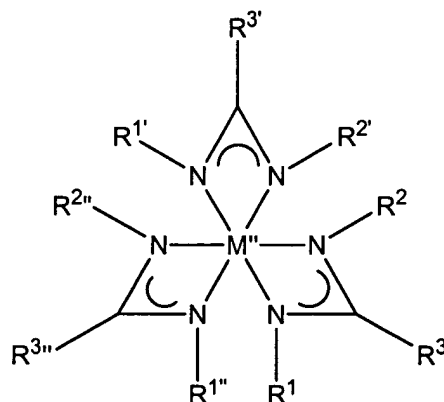
or oligomers thereof, wherein R^1 , $R^{1'}$, R^2 , and $R^{2'}$ independently represent alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, or other non-metal atoms or groups that are not aryl, and R^3 and $R^{3'}$ independently represent hydrogen, alkyl groups, alkenyl groups, alkynyl groups, trialkylsilyl groups, or other non-metal atoms or groups that are not aryl.

34. (New) The process of claim 33, wherein M' is selected from the group consisting of cobalt, iron, nickel, manganese, ruthenium, zinc, titanium, vanadium, chromium, and europium.

35. (New) The process of claim 34, wherein the one or more volatile amidinate compounds is represented by the structural formula



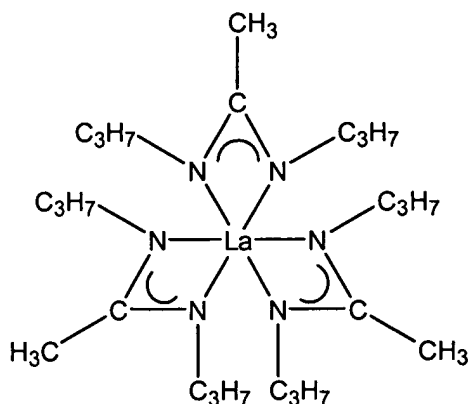
36. (New) The process of claim 20, wherein the one or more volatile metal amidinate compounds is represented by the general formula



or oligomers thereof, wherein R^1 , $R^{1'}$, R^2 , and $R^{2'}$ independently represent alkyl, alkenyl, alkynyl, trialkylsilyl, or other non-metal atoms or groups that are not aryl, and R^3 and $R^{3'}$ independently represent hydrogen, alkyl, alkenyl, alkynyl, trialkylsilyl groups, or other non-metal atoms or groups that are not aryl.

37. (New) The process of claim 36, wherein M'' is selected from the group consisting of lanthanum, praseodymium and the other lanthanide metals, yttrium, scandium, titanium, vanadium, niobium, tantalum, chromium, iron, ruthenium, cobalt, rhodium, and iridium.

38. (New) The process of claim 37, wherein the one or more volatile amidinate compounds is represented by the structural formula



39. (New) The process of claim 20, wherein the thin film comprises a metal selected from the group consisting of copper, silver, gold, iridium, cobalt, nickel, iron, zinc, europium, ruthenium, manganese, chromium, vanadium, niobium, tantalum, titanium, lanthanum, praseodymium, yttrium, scandium, and rhodium.

40. (New) The composition of matter as claimed in claim 14, wherein Rⁿ represent unsubstituted alkyl groups.

41. (New) The composition of matter as claimed in claim 14, wherein Rⁿ represent alkyl groups substituted with fluorine or other non-metal atoms.

42. (New) The composition of matter as claimed in claim 16, wherein Rⁿ represent unsubstituted alkyl groups.

43. (New) The composition of matter as claimed in claim 16, wherein Rⁿ represent alkyl groups substituted with fluorine or other non-metal atoms.

44. (New) The composition of matter as claimed in claim 18, wherein Rⁿ represent unsubstituted alkyl groups.
45. (New) The composition of matter as claimed in claim 18, wherein Rⁿ represent alkyl groups substituted with fluorine or other non-metal atoms.